

LII.—Notes on the Rats ; with the Description of some new Species from Panama and the Aru Islands. By Dr. J. E. GRAY, F.R.S. &c.

THE species of Rats are exceedingly difficult to distinguish ; and from many species having the habit of going on board ships, and of being carried about in goods, the same species becomes spread over different parts of the world, rendering it very unsafe to distinguish them by their geographical distribution. The skulls afford one of the best characters to separate the species into groups ; and therefore I have arranged the various skulls in the British Museum thus, and described three species which I did not find recorded in the catalogues in such a manner that I could recognize them.

The British Museum has lately procured from Paris a rat from Panama, which I do not find described, and am therefore inclined to think is new. It is well distinguished from all other rats by the form of the skull, and especially of the cavity on the side of the nose in front of the orbit.

NEOMYS.

Head short, rather conical. Whiskers long, smooth, black. Eyes moderate. Ears rounded, naked. Fur very soft, close, with very slender, rather stiffer, black hairs. Feet covered with very short close hair. Toes quite free, four in front, five behind, with short curved claws, which are partly covered with white hairs at the base. Tail elongate, naked, slender, covered with close, regular, thin, square scales placed in rings ; black, the terminal third being white.

Skull broad, depressed, nearly twice as long as wide, flat above, with a thin edge above the eyebrow, which is continued on and expanded out, forming a wide sharp keel on the sides of the temples. The aperture in front of the orbit narrow, linear, erect, with a sharp, nearly straight, slightly arched hinder edge, and a large concavity in front, which is not so long as high and has a slanting ridge in front, so that it is much narrower at the lower part than the hinder one, and has an arched lower edge ; there is a tubercle in the middle of the front edge. Teeth $\frac{3.3}{3.3}$, as in *Mus*.

This genus is at once known from the true genus *Mus* by the softness and slenderness of the longer hair and the general softness of the fur. The skull is at once distinguished from that of the genus *Mus* by its very flat broad crown, which has a rather broad expanded edge over the eyes and the upper part of the temporal muscles, and in the form of the aperture in front

of the orbit, and the concavity on the side of the nose before it. The concavity on the side of the nose in front of the eye is broad and deep, and is suddenly narrowed on the lower side, so as to leave a narrow erect opening on the lower part of the side of the nose, which has a rather raised front edge on its lower part, as in *Mus decumanus*.

Fig. 1.

Skull of *Neomys panamensis*.*Neomys panamensis*. (Fig. 1.)

Mouse-coloured; back blackish-washed, with longer hairs; sides of the head and body rather paler; throat, chest, under-side of body, and inside of legs white; feet brownish, with white hairs over the claws; tail slender, naked, glossy black, white at the end. Size of a common rat (*Mus decumanus*).

Hab. Panama (*Boucard*).

NESOKIA.

Skull short, broad, broader than half the length ($1\frac{3}{4}$ to 1). The nose short, slender, and compressed. Slit before the orbit narrow, expanded and oval above, thickened on the front edge.

Nesokia kok. *N. hydrophorus*.

HELIOMYS.

The skull rather broad, flat above, about once and two thirds as long as wide at the back of the orbits. Orbits wide. Forehead between the eyes narrow, with a ridge on each side, and the sides parallel. The cavity before the eyes triangular, deep, not so long as high, above with a straight, scarcely lamellar, hinder edge, and a thickened, shelving, convex front edge. Palatine groove elongate. Nose rather broad.

I do not know the animal belonging to this skull, which we received from Professor Jeude from the Utrecht Museum; but it is exceedingly different from the skulls of all the rats which I had previously seen, by its breadth, the spreading of the zygomatic arch, the narrow forehead between the eyes, and the peculiar form of the aperture in front of the orbit, and also by the thickening of the central part of the substance of the central

lobe of the lower jaw, and by the very great length of the upper and lower lobes of its hinder edge.

Fig. 2.

Skull of *Heliomys Jeudei*.

Heliomys Jeudei. (Fig. 2.)

Hab. Unknown.

BANDICOTA.

Skull elongate, about twice as long as wide at the hinder part of the orbits. Nose elongate. Slit before the orbit short, with a thick callous front edge, oval and expanded above. Palatine slits elongate.

Bandicota gigantea.

The British Museum received two specimens of a male and female rat, which Dr. A. B. Meyer obtained at Aru Island in April 1870, and at Buntimunang, in the south-west part of Celebes, in November. It is intermediate in size and the harshness of the fur between the Bandicote and the Norway rat (*Mus decumanus*).

UROMYS, Peters.

Skull elongate, about twice as long as broad at the hinder part of the orbit. Nose arched down. Slit before the orbits short; front edge simple, with a conical projection contracting the slit and expanding into an oval form above. The palatine slits rather short.

Dr. Peters established this genus upon a rat which I had described under the name of *Mus macropus* (P. Z. S. 1866, p. 221)—calling it *Uromys macropus* (Peters, Monatsber. 1867, p. 3, t.), and giving a very good figure of the animal, with details of its skull; but *macropus* is a larger species than *U. aruensis*, the skull is not so arched and bent down in front, and the tail is nearly two thirds white and the basal third dark. The palatine slits are equally short in both species.

Uromys aruensis.

Reddish brown: back, especially in the middle, varied with

black-brown stiffer hairs; whiskers very long, black; upper lip, lower side of head, throat, chest, underside of body, and inner side of limbs pure white; ears rather large, naked; tail elongate, rather longer than body and head, rather thick at the base, tapering, black, terminal quarter white; feet covered with very short hair; claws strong, naked.

Skull elongate, $2\frac{1}{3}$ inches long, and $1\frac{1}{6}$ inch broad at the zygomatic arch. Nearly the same size as the skull of *Bandicota gigantea*; but the forehead is much more curved down, the cavity in front of the orbit is smaller, and the front edge of the cavity is not thickened on the front margin, and is furnished with an acute, subcentral, conical projection, contracting on the upper part of the perpendicular cleft. Teeth bright yellow and much incurved. Palatine slits rather short, not more than two thirds the length of the slits in *B. gigantea*, nor nearly so long as they are in the much smaller *Mus decumanus*.

Mus.

Skull elongate, twice as long as broad at the hinder edge of the orbit. The slit in front of the orbit narrow, elongate, extended above into an oval cavity. Slit in the front of the palate elongate.

Mus decumanus, *M. rattus*, *M. indicus*, *M. piloides*, *M. cervinipes*, *Holochilus brasiliensis*, *H. cephalotes*, and *Mus alexandrinus*, which has the slit in front of the nostrils shorter and wider than the rest, as is also the case with *Laggada platythrix*, *L. boodunga*, *Golunda barbara*, and *G. meltada*: these have the front teeth smooth; *G. Ellioti* has the front teeth with a central longitudinal groove.

BIBLIOGRAPHICAL NOTICES.

The Sea and its Living Wonders; a Popular Account of the Marvels of the Deep, and of the Progress of Maritime Discovery from the earliest ages to the present time. By Dr. G. HARTWIG. 4th edition. 8vo. Longmans: London, 1873.

ON the appearance of the first edition of this book we gave a notice of its contents in this journal; and it is with pleasure that we now announce the publication of a fourth edition. Dr. Hartwig's volume is undoubtedly one of the best of the tolerably numerous class to which it belongs; and it is rather to be wondered that it has not secured even a wider sale than would seem to be indicated by the number of editions which it has reached.

In the new edition the general treatment of the subject is the same as in former issues; but the author has made many important addi-